

## WE CLAIM:

1. An occlusion device for an anastomosis procedure comprising:
  - a low profile shaft assembly configured for insertion into a vessel,
  - said shaft assembly having a lumen extending through said shaft assembly, an expandable region at the distal end of said shaft assembly and a sealing membrane spanning said expandable region,
  - said expandable region being deployable from a first low-profile position to a second expanded position;
  - means for deploying said expandable region from said first low-profile position to said second expanded position;
  - a clamping member positioned generally opposite to and moveable towards said expanding region, said clamping member having a distal end shape corresponding to said expanding region in its second expanded position;
 and
  - a perfusion tube in fluid communication with said shaft assembly lumen, said perfusion tube terminating in a sealing bulb adapted for deployment within a vessel.
2. The device of claim 1 wherein said expandable region includes the expandable region bowing portions that bow outward.
3. The device of claim 2 wherein said bowing portions further comprise a flexible tube having a through slot.
4. An occlusion device for an anastomosis procedure comprising:
  - a housing having a slide located therein, said slide mounted to said housing and moveable from a first position to a second position;
  - a rigid shaft assembly connected to the slide and having a portion thereof extending from the housing, said shaft assembly having a lumen extending therethrough;

a clamping member pivotally mounted to the housing, said member having a slide actuator engaged with said slide, and a lever arm extending from the housing and terminating in a distal end defining a first planar geometry;

a flexible tube extending over said extending portion of said shaft assembly, said tube having a proximal end terminating near the housing, a distal end, and an expanding region proximal to the distal end, said expanding region having first and second bowing portions and an elastomeric sealing membrane over said bowing portions;

wherein pivotal movement of the clamping member moves said slide from said first position to said second position, thereby moving said rigid shaft assembly from a first to second position and causing said bowing portions to expand outward from said shaft assembly; and

a perfusion tube in fluid communication with said shaft assembly lumen, and said perfusion tube terminating in a sealing bulb adapted for deployment within a vessel.

5. The device of claim 4 wherein said expanding region is defined by a slot extending through the flexible tube to form said first and second bowing portions.

6. The device of claim 4 wherein said pivotal movement of the clamping member further results in movement of said lever arm toward said expanding region.

7. An occlusion device for an anastomosis procedure comprising  
a housing having a slide located therein, said slide moveable from a first to a second position;

a shaft assembly extending from said housing, said shaft assembly having a rod extending through the shaft, an expandable region at the distal end of the shaft assembly, and a sealing membrane spanning said expandable region of the shaft assembly, the rod being connected at one end to said slide and at its other end to

the distal end of the shaft, and the expandable region being deployable from a first, low-profile position to a second expanded position;

a member comprising a clamping member pivotally mounted to said housing and extending therefrom, said clamping member having a distal end shape corresponding to said expandable region in its second expanded position; and

a perfusion tube placed in fluid communication with said shaft assembly, said perfusion tube terminating in a sealing bulb adapted for deployment within a vessel.

8. The device of claim 7 further comprising a slide actuator capable of moving said slide from said first to said second position.

9. The device of claim 8 wherein said slide actuator further comprises two cam portions having inner and outer edges, said inner edges defining a receiving groove between said cam portions, and wherein said slide actuator further comprises a knob having first and second pins extending therefrom, said first pin being received within said receiving groove and said second pin being received alongside one of said outer edges,

whereby upon rotational movement of said knob, said first pin engages said slide causing translational movement of said slide from said first position to said second position, and said second pin moves relative to said slide from the outer edge of said first cam portion to the outer edge of said second cam portion.

10. The device of claim 9 wherein said slide is capable of being locked in said first or second position.

11. The device of claim 7 further comprising a clamping member actuator capable of pivotally moving said member.

12. The device of claim 11 wherein said clamping member actuator comprises a turn screw operably linked to said member such that rotation of said screw pivotally moves said member.

13. An occlusion system for an anastomosis procedure comprising:  
 a low profile shaft assembly configured for insertion into a vessel,  
 said shaft assembly having a lumen extending through said shaft assembly and terminating in a port at the proximal end of the shaft assembly, an expandable region at the distal end of said shaft assembly, and a sealing membrane spanning said expandable region,  
 said expandable region being deployable from a first low-profile position to a second expanded position;  
 means for deploying said expandable region from said first low-profile position to said second expanded position;  
 a clamping member positioned generally opposite to and moveable towards said expanding region, said clamping member having a distal end shape corresponding to said expanding region in its second expanded position; and  
 a perfusion tube being adapted to be secured to the shaft assembly port, said tube terminating in a sealing bulb adapted for deployment within a vessel.

14. The system of claim 13 wherein said expandable region includes the expandable region bowing portions that bow outward.

15. The system of claim 14 wherein said bowing portions further comprise a flexible tube having a through slot.

16. An occlusion system for an anastomosis procedure comprising:  
 a housing having a slide located therein, said slide mounted to said housing and moveable from a first position to a second position; a rigid shaft assembly connected to the slide, and having a portion thereof extending from the housing,

said shaft assembly having a lumen extending therethrough and terminating in a port at the proximal end of the shaft assembly;

a clamping member pivotally mounted to the housing, said member having a slide actuator engaged with said slide, and a lever arm extending from the housing and terminating in a distal end defining a first planar geometry;

a flexible tube extending over said extending portion of said shaft assembly, said tube having a proximal end terminating near the housing, a distal end, and an expanding region proximal to the distal end, said expanding region having first and second bowing portions and an elastomeric sealing membrane over said bowing portions;

wherein pivotal movement of the clamping member moves said slide from said first position to said second position, thereby moving said rigid shaft assembly from a first to second position and causing said bowing portions to expand outward from said shaft assembly; and

a perfusion tube being adapted to be secured to said shaft assembly port, said perfusion tube terminating in a sealing bulb adapted for deployment within a vessel.

17. The system of claim 16 wherein said expanding region is defined by a slot extending through the flexible tube to form said first and second bowing portions.

18. The system of claim 16 wherein said pivotal movement of the clamping member further results in movement of said lever arm toward said expanding region.

19. An occlusion system for an anastomosis procedure comprising a housing having a slide located therein, said slide moveable from a first to a second position;

a shaft assembly extending from said housing, said shaft assembly having a rod extending through the shaft and terminating in a port at the proximal end of the shaft assembly, an expandable region at the distal end of the shaft assembly,

and a sealing membrane spanning said expandable region of the shaft assembly, the rod being connected at one end to said slide and at its other end to the distal end of the shaft, and the expandable region being deployable from a first, low-profile position to a second expanded position;

a member comprising a clamping member pivotally mounted to said housing and extending therefrom, said clamping member having a distal end shape corresponding to said expandable region in its second expanded position; and

a perfusion tube placed in fluid communication with said shaft assembly, said perfusion tube terminating in a sealing bulb adapted for deployment within a vessel.

20. The system of claim 19 further comprising a slide actuator capable of moving said slide from said first to said second position.

21. The system of claim 20 wherein said slide actuator further comprises two cam portions having inner and outer edges, said inner edges defining a receiving groove between said cam portions, and wherein said slide actuator further comprises a knob having first and second pins extending therefrom, said first pin being received within said receiving groove and said second pin being received alongside one of said outer edges,

whereby upon rotational movement of said knob, said first pin engages said slide causing translational movement of said slide from said first position to said second position, and said second pin moves relative to said slide from the outer edge of said first cam portion to the outer edge of said second cam portion.

22. The system of claim 21 wherein said slide is capable of being locked in said first or second position.

23. The system of claim 19 further comprising a clamping member actuator capable of pivotally moving said member.

24. The system of claim 23 wherein said clamping member actuator comprises a turn screw operably linked to said member such that rotation of said screw pivotally moves said member.

25. A method of partially occluding a vessel using the device of claims 1, 4, or 7.

26. A method of performing an anastomosis procedure using the device of any of claims 1, 4, or 7.

27. A method of distally perfusing a vessel while performing an anastomosis procedure using the device of claim 1, 4 or 7.

28. A method of partially occluding a vessel using the system of claims 13, 16, or 19.

29. A method of performing an anastomosis procedure using the system of any of claims 13, 16, or 19.

30. A method of distally perfusing a vessel while performing an anastomosis procedure using the system of claim 13, 16 or 19.